

Oxygen Stabilization Induced Enhancement in J_c and T_c
of Superconducting Oxides

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In an attempt to enhance the electrical and mechanical properties of the high temperature superconducting oxides, we have prepared high T_c composites composed of the 123 compounds and AgO. The presence of extra oxygen due to the decomposition of AgO at high temperature is found to stabilize the superconducting 123 phase. Ag is found to serve as clean flux for grain growth and precipitates as pinning center. Consequently, almost two orders of magnitude enhancement in critical current densities has also been observed in these composites. In addition, these composites also show much improvement in workability and shape formation.

On the other hand, proper oxygen treatment of $Y_5Ba_8Cu_{11}O_y$ was found to possibly to stabilize superconducting phase with T_c near 250 K. I-V, ac susceptibility and electrical resistivity measurements indicate the existence of this ultra high T_c phase in this compound. Detailed Structure, microstructure, electrical, magnetic and thermal studies of the superconducting composites and the ultra high T_c compound will be presented and discussed.

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